Rebuilding the Spear

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Rebuilding the Spear

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The most recognizable Marine Air-Ground Task Force (MAGTF) that exists is the Marine Expeditionary Unit (MEU), commonly referred to as “the tip of the spear”. This is due to the forward presence that the MEU creates; an American symbol of quick response, national strength, and the expeditionary nature of the Marine Corps through the presence of the Amphibious Readiness Group (ARG). The MEU is made up of a mutually supporting combination of a command element, a ground combat element, a combat service support element, and an aviation combat element (ACE). Within the ACE is a composite squadron centered on a squadron of twelve to fourteen CH-46E helicopters.[1] Attached to this squadron are four CH-53E Super Stallions, four to six AH-1W Cobras, three UH-1N Hueys, and six AV-8B Harriers.[2] With the bulk of the support being made up of CH-46Es, common sense holds that the MEU can extend the bulk of its combat power only as far as the range of the CH-46E. But recent world events, particularly in Afghanistan, have shown that the CH-46E may no longer have the operational capability necessary for the MEU to meet its changing operational needs. By reconfiguring the composite squadron with eight CH-53Es, six to eight CH-46s, six AH-1Ws, three UH-1Ns, and six AV-8Bs, the MEU’s operational capabilities will significantly increase to match current needs

[1] Called a Marine Heavy Helicopter Squadron Reinforced or HMM (rein).
[2] This is a standard mix. Some MEU COs opt for more AH-1Ws, less Hueys, more Harriers, etc. Always the core is the CH-46E.

without a negative impact on cost or logistical support capability.

CURRENT DOCTRINES

The earth's oceans cover 70% of the world's surface. Accordingly, 80% of the world's capital cities and 70% of the world's population are located within 200 nautical miles (nm) of any ocean (qtd. in Wilhelm 28). What about the other 30%? Current Marine Corps doctrine has focused on the littorals, those areas near the coasts that allow our forces to maneuver over the horizon (OTH) and prepare our forces for whatever mission is required. The Marine Corps' focus on OTH tactics, expeditionary maneuver warfare (EMW) and ship to objective maneuver (STOM) have expanded the MEU's area of responsibility beyond the littorals, requiring forces that can travel long distances, carry sufficient combat loads, and do not have to rely on host nation support to accomplish the mission. The capabilities of the CH-53E help to meet that requirement.

OPERATIONAL COMPARISON

The CH-53E is classified as a heavy lift helicopter with a primary mission of providing combat assault transport of heavy weapons and supplies (Aviation Operations 2-12). On a normal day (32^{o} C at sea level), the CH-53E can carry 32,000 lbs on two hooks or carry about 30,000 lbs of cargo internally fifty miles round trip (CH-53E NATOPS 1-1). As a secondary mission, the 53E

can carry lighter loads, including twenty-four passengers (peacetime constraint) 400 nm without refueling. In combat situations, that number can be increased to fifty- five (one for each seatbelt with centerline seats installed). During in extremis situations, the number of passengers may be higher, limited only by ambient atmospheric conditions (CH-53E NATOPS 1-1).

The CH-46E is classified as a medium lift helicopter with a primary mission of providing combat assault troop transport (Aviation Operations 2-12). As such, on a normal tropical day (32^{o} C at sea level) the CH-46E can carry about 10-15 combat loaded Marines for a combat radius of approximately 50-75 nm before having to refuel (Clark 2). As a secondary mission, the 46E provides combat assault transport of supplies and cargo (Aviation Operations 2-12). It can carry 3,500 lbs on one cargo hook or loaded internally (CH-46E NATOPS 4-17).

While in ‘high, hot’ conditions (altitude of 3000 ft, 91.5 deg F) the 53E’s capabilities can be reduced to carrying 7,600 lbs for 200 nm (Colucci 34). When carrying passengers, the normal cruising speed for a 53E is about 140-160 knots indicated airspeed (KIAS). However, when carrying an external load, the 53E’s speed is limited only by the aerodynamic characteristics of the load, which could be anywhere from 40-100 KIAS (CH-53E NATOPS 9-41).

For 46s in those high, hot conditions, the degradation for 46Es is even worse. “While we (15th MEU) were in Oman (120o F at sea level), our base camp was 3,000 ft in the mountains. The 53Es were carrying 24 passengers (peacetime limitation) and 10,000 lbs fuel bladders while the 46s were carrying 4 Marines at a time. This clobbered the deck cycle and slowed the build-up” (Daniels). Even in good conditions, the 46E’s are slow. When loaded, the 46E has to reduce its cruising speed to below 100 knots (CH-46E NATOPS 4-15).

Perhaps the biggest disparity between the two helicopters comes when comparing the effective combat ranges. At sea level, an empty 46E with a normal four-man crew has just over 2 hours of flight time at 120 KIAS. Fully loaded under those same conditions, that 46E must refuel every 90 to 100 minutes (Willison 3). An empty 53E with a crew of four can fly for over four hours, unless aerial refueling, and then their range is unlimited. For Operation Eastern Exit, two CH-53Es, each loaded with 30 combat loaded Marines, flew 466 nm from the USS Guam to the American embassy in Mogadishu, in order to rescue the embassy staff from rampaging crowds. The 53Es aerial refueled twice on the way in and once on the way out (Fulwiler and Hinkle 45). For Operation Enduring Freedom (OEF), CH-53s flew 285 nm from the USS Peleliu to deliver troops into Afghanistan, executing the longest amphibious raid to date (Holtermann). To

accomplish that, two 53Es installed internal fuel bladders that allowed them to refuel their Cobra escorts at makeshift forward arming/refueling points (FARPS). The ability to aerial refuel and act as a mobile FARP site are characteristics unique to the CH-53E. Both abilities, particularly FARPing, allow the MAGTF commander to project Marine presence further inland and to support expeditionary warfare (Dana 85). Where the 46E may be suited for smaller distances, lighter loads, and smaller landing zones, the 53 directly supports, and can lift, the majority of the MEU's combat force. As such, the 53E squadron should be the centerpiece of the MEU's ACE.

COST COMPARISON

Maintaining the CH-46E and the CH-53E airframes are not cheap. Historically, the 53E has always required more man-hours and money to maintain readiness. Fiscal year (FY) 2000 reports state that the average cost per flight hour was more than $11,600, almost twice the cost of the $6,000 per flight hour of the CH-46E (Dowling 108). Although the 46E appears cheaper, that cost has risen over 75% since FY 1993, even though flight hours for the 46E have declined by over 23% (Guardiano "Marine Corp"). One of the reasons for the dramatic rise in 46E maintenance is the aircraft's age. "Despite programs to extend the service life of the Sea Knight (CH-46E), maintenance personnel are finding that components that have never failed are

beginning to break due to increased age and fatigue" (qtd. in Guardiano "Marine Corp").

The increase in equipment failures translates as more money and more man-hours of maintenance for the 46E. During its first years of service, the CH-46E needed as little as 17 hours of maintenance for every flight hour. However, over the last decade the 46 has seen a dramatic rise in man-hour to flight hour maintenance. In 2001, it took an average of almost 30 man-hours for every hour flown (Guardiano "Osprey"). That is an increase of 43%.

Although expensive, the inflation in maintenance has not been nearly as dramatic for the 53E. The 53E takes about 42 man-hours of maintenance per hour of flight, and although higher than the 46, it has become an accepted fact of doing business for 53E maintenance departments. Indeed, since FY 1997, maintenance man-hours per flight hour have increased by only 12% (Dowling 109). As the airframes continue to age, the 46E will equal the 53E in man-hours and cost. Why continue to strain the 46E community while awaiting its replacement, the vaunted and highly controversial V-22 Osprey? Reducing the 46Es presence in the MEU will allow the community to continue to fulfill the medium lift requirement until the V-22 finally comes on line.

For MEU operations, the maintenance intensive 53E is generally the sticking point for most missions. A common

aviation maintenance saying is that “it takes four to make three”.[3] That adage describes situations that are common to all the aviation elements of the MEU; however, why have twelve 46s to make nine or ten, when the difference can be made up with one 53E? 100% availability (improbable) in a 46E squadron of twelve aircraft translates to about 120 troops (12 x 10) that could be moved. 65% availability of the 53 detachment of eight equates to 120 troops (5 x 24 with the peace time constraint). This mass of assault support does not even include any additional loads that could be carried in along with the 24 passengers. That is one more reason to increase the 53E MEU detachment to eight aircraft. By following normal planning expectations of a 90% first start availability followed by an estimate of 75% available for continuous operations, having eight 53Es would “make” six for larger missions, still keeping the 53Es the significant assault support package for the MEU ACE.

LOGISTICAL CONCERNS

One of the main concerns with increasing the 53E det is the amount of space on ARG shipping. The space required for a normal MEU 53E detachment consists of 9.6 46E equivalent spots[4], and approximately 50 Marines. The amount of space required for

[3] “4 to make 3” means that due to maintenance requirements, a four-plane detachment may have only three aircraft available at any one time. “4 to make 2”, 8 to make 6”, etc, are also used.

[4] Aircraft space on amphibious shipping is measured in 46E equivalent spaces, i.e. how many 46Es can fit in the same space. A 53E equals 2.4 46Es.

a “double det” of eight 53Es would increase those numbers to 19.2 46E equivalent spaces, and approximately 100 –110 Marines. Everything on a 53E is large: the blades, the main gearbox, the engines, even the tires. Storage space is at a premium and will be a major concern to all the ACE components. But the “double det” has been done. In 2002, the 15th MEU (SOC) deployed with four 53Es from Marine Heavy Helicopter squadron 465 (HMH-465), and was then augmented with an additional four 53Es from HMH-361 for Operation Enduring Freedom (Williams).

The staging of up to four 46Es (or two 46Es and three AH-1Ws) on a LPD along with up to four 46Es (or four AH-1Ws and two Hueys) on a LSD would not only open up more hangar and maintenance space on the LHD/LHA, but also simplify the deck cycles.[5] This would allow the MEU commander the option of conducting split ARG operations or permit the shorter ranged escorts to be ready to launch with the main assault package, thus simplifying the overall deck cycle. Obviously, comprehensive deck crew training for all the supporting ships’ crews would be necessary. Pre-staging fuel, ammo, and ACE personnel would also be required for the “small decks” to function independently; however, these considerations are outweighed by the benefits of the capabilities for split ARG operations. Split ARG operations have become prevalent in

[5] Both the LPD and LSD have space for 4 46E equivalents. Hangar and maintenance spaces are ad hoc, however.

recent years and will only become more common with the new strike ARG package currently being deployed.[6]

Restructuring the MEU ACE will affect more than just the flying squadrons. The Marine Aviation Logistics Squadrons (MALS) also sends a detachment of personnel and equipment in support of the flying squadrons, and that detachment must be augmented to serve the needs of an increase in CH-53Es. The AVCAL (aviation consolidated allowance list) would have to allow for more repairable and consumable maintenance items (Fitzgerald). In addition, billeting could be an issue, as the increased number of 53E maintainers may be more than the reduced requirement for CH-46 maintainers. In addition, the individual material requirement list (IMRL) list (similar to a table of organization) for the complete MALS detachment cannot be easily tailored (Ramsey). However, as 53E squadrons are designed to be triple sited (one- eight plane base squadron and two- four plane dets), the IMRL list for that eight plane base squadron already exists, making it very easy to be applied to a 53E ACE (T/O 8960). The only table of organization (T/O) and IMRL reworking to be done would be the reduction of the 46E requirements.

[6] The "Strike ARG" contains 3 amphibious ships as well as 2 surface warfare vessels and several anti-sub assets.

ISSUES FOR RECOMMENDATIONS AND CONSIDERATION

Establishing the 53E as the ACE on the MEU will present other challenges. As the CH-53E would more rapidly approach the end of its original service life, various systems and components would require replacement. However, the CH-53E SLEP (service life extension program) currently being planned will include a comprehensive overhaul of all the major dynamic components of the 53E. With new rotor blades, a new rotor head, engines and a cargo hook system, the 53E's capabilities will only increase.

One problem to consider is the number of 53E airframes available. One possibility would be to integrate the CH-53D squadrons into the UDP rotation, providing 53E airframes that could be used for the HMH (rein).[7] Though the 53D is classified as a medium lift helicopter and cannot aerial refuel, it can still provide over three times the lift of a 46E, can carry internal fuel tanks for FARPS, and has a five hour fuel endurance.

Furthermore, the two reserve CH-53E squadrons, one located on each coast, could be called upon to fulfill some of the more time intensive training evolutions, particularly the Combined Arms Exercises (CAXs) and the Weapons and Tactics Instructor

[7] Designation for a composite squadron based on a Marine Heavy Helicopter squadron-HMH (rein).

(WTI) classes, to support the Marine Expeditionary Force (MEF) requirements in CONUS.

CONCLUSION

Traditionally, the MEU has been called “the tip of the spear.” In today’s changing theatres of operation, that “spear” needs to be able to travel farther. The CH-46E has been useful in the past, dealing with short rage deliveries of personnel from ship to shore. However, in order to better execute the new, maneuver based, over- the- horizon doctrine that the Marine Corps has developed, the Corps requires an assault helicopter with endurance, speed, and the ability to rapidly build up combat power. The only such aircraft that the Marine Corps has is the CH-53E. It out performs the CH-46E in every respect, can carry more personnel, more cargo, and more firepower to the fight. It can travel farther, require little outside support and can integrate easily into the existing mold as the centerpiece of the MEU ACE composite squadron. Operationally, integrating the CH-53E as the focal point of the MEU ACE will be a challenge, both to the readiness and training of aircrew and maintainers, and to the impact that integration will have on other lift oriented evolutions. These difficulties need to be addressed and can be overcome with the proper preparation and coordination with both manpower and maintenance providers.

The world is changing, the threats are changing, and the MEU must be able to respond to those threats, no matter where the threats might originate. Basing the composite squadron on the CH-53E will give the MEU commander greater range and flexibility to respond to those threats, delivering more Marines and equipment to the fight, quicker and farther. The “spear” can be made stronger.

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